

200314101-1

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REMARKS

This is a full and timely response to the non-final Official Action mailed **March 28, 2007**. Reconsideration of the application in light of the following remarks is respectfully requested.

Claim Status:

Claims 31-67 were withdrawn from consideration under a previous Restriction Requirement and cancelled without prejudice or disclaimer. Claims 10, 14, 16, 69 and 70 have also been cancelled previously without prejudice or disclaimer. No amendments to the application are proposed by the present paper. Thus, claims 1-9, 11-13, 15, 17-30, 68 and 71-82 are currently pending for further action.

Allowable Subject Matter:

In the recent Office Action, the Examiner indicates the presence of allowable subject matter in claims 7, 8 and 80. Applicant wishes to thank the Examiner for this identification of allowable subject matter.

Prior Art:

Claims 1-6, 9, 11, 15 and 17-29 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of U.S. Patent Application Publication No. 2004/0036200 to Patel et al. ("Patel-1") and either U.S. Patent No. 7,120,512 to Kramer ("Kramer-1") or U.S. Patent App. Pub. No. 2005/0012247 to Kramer ("Kramer-2"). This rejection is respectfully traversed under 35 U.S.C. § 103(c).

200314101-1

10/701,885

The recent Office Action correctly notes that this rejection may be traversed under 35 U.S.C. § 103(c), which is the case. (Action of 3/28/07, p. 4). 35 U.S.C. § 103(c) states:

Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Applicant notes that both Kramer references are available as prior art against the present application only under 35 U.S.C. § 102(e). The present application was filed on November 4, 2003 prior to the issuance of Kramer-1 on October 10, 2006 and the publication of Kramer-2 on January 20, 2005. Thus, both Kramer references are available as prior art against the present application *only* under 35 U.S.C. § 102(e).

Applicant also notes that both Kramer references are assigned to the Hewlett-Packard Development Co., L.P. (*See*, recorded assignments at reel/frame 014447/0928 (Kramer -1) and reel/frame 014314/0015 (Kramer-2)). Similarly, the present application is also assigned to the Hewlett-Packard Development Co., L.P. (*See*, recorded assignment at reel/frame 014685/0031).

Applicant hereby states that the subject matter of the present application and that of both the Kramer references was, at the time the invention of the present application was made, owned by, or subject to an obligation of assignment to, the same person, i.e., Hewlett-Packard Development Co., L.P. (*See* MPEP § 706.02(l)(2)). Consequently, under 35 U.S.C. § 103(c), the Kramer references *cannot* be applied as prior art against the present application under 35 U.S.C. § 103(a). Therefore, the rejection of claims 1-6, 9, 11, 15 and 17-29, which alternatively applies either of the Kramer references under § 103(a), must be reconsidered and withdrawn.

200314101-1

10/701,885

Claims 12, 13 and 30 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of U.S. Patent Application Publication No. 2004/0145088 to Patel et al. ("Patel-2") and either Kramer-1 or Kramer-2 and further in view of U.S. Patent App. Pub. No. 2004/0099983 to Dirscherl ("Dirscherl"). As above, this rejection is respectfully traversed under 35 U.S.C. § 103(c). As demonstrated above, under 35 U.S.C. § 103(c) Kramer-1 and Kramer-2 cannot be applied as prior art against the present application in a rejection under § 103(a). For at least this reason, this rejection, based in part on the Kramer references, should be reconsidered and withdrawn.

Claims 68 and 71-79 were rejected under 35 U.S.C. § 103(a) over the combined teachings of Patel-2 and Dirscherl. This rejection is respectfully traversed for at least the following reasons.

Claim 68 recites:

A method for solid free-form fabrication of a three-dimensional object, comprising:
depositing a layer of phase-change material;
selectively applying an ultraviolet initiator in a predetermined pattern to said phase-change material, wherein said pattern of said ultraviolet initiator defines a cross-section of said three-dimensional object; and
exposing said ultraviolet initiator to an ultraviolet light to cross-link said phase-change material in said predetermined pattern,
wherein said phase-change material, after being deposited, is in a solid phase, said method further comprising liquefying said phase-change material.
(Emphasis added).

Applicant notes that the phase-change material, which is liquefied, is also the build material in which the ultraviolet initiator "defines a cross-section of said three-dimensional object."

As conceded by the Office Action, Patel-2 does not teach or suggest liquefying a phase change material that was deposited and has been brought into a solid phase. (Action of

200314101-1

10/701,885

3/28/07, p. 6). Consequently, Dirscherl is cited as teaching liquefying a solid phase-change material.

Dirscherl teaches a system in which a solid support material is machined to produce a recess corresponding to a layer of an object being formed. The recess (103) is then filled with a material (104) that is then melted with a laser (109) to cause cross-linking and form the desired layer of the object. (Dirscherl, abstract). Consequently, the build material taught by Dirscherl is melted to achieve cross-linking. No ultraviolet initiator is used as in claim 68. Therefore, one of skill in the art would naturally appreciate that the systems of Patel-2 and Dirscherl operate on entirely different principles.

Consequently, one of skill in the art would have no reason whatsoever to use the liquefaction of a build material for cross-linking taught by Dirscherl in the ultraviolet cross-linking system recited in claim 68. According to the U.S. Supreme Court, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements [of the prior art] in the way the claimed new invention does.” (*KSR International Co. v. Teleflex, Inc.*, 550 U.S. ____ (2007). “To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple patents; to the effects of demands known to the design community or present in the marketplace; and to the background knowledge possessed by a person having ordinary skill in the art. *To facilitate review, this analysis should be made explicit.*” (*Id.*) (emphasis added).

According to the Office Action, this proposed combination of Patel-2 and Dirscherl would have been obvious “in order to remove material, e.g., support material) which is not required for the final product.” (Action of 3/28/07, p. 6). However, neither reference teaches liquefying a solid material in order to remove support material. The supporting material

200314101-1

10/701,885

(102) taught by Dirscherl, in which the recess is machined, is not melted or liquefied. In fact, Dirscherl expressly states that the support material should be "resistant to heat." (Dirscherl, paragraph 0028).

Consequently, there does not appear to be any valid reason why one of skill in the art would have combined the disparate teachings of Patel-2 and Dirscherl in the manner proposed in the Office Action. For at least these reasons, the proposed combination of Patel-2 and Dirscherl cannot support a rejection of claim 68 or its dependent claims.

Under the analysis required by *Graham v. John Deere*, 383 U.S. 1 (1966), the scope and content of the prior art must first be determined, followed by an assessment of the differences between the prior art and the claim at issue. In the present instance, no prior art reference of record teaches or suggests the claimed method of depositing a phase-change build material that is patterned with an ultraviolet initiator and liquefied from a solid phase at some point after being deposited. The two very different systems taught by Patel-2 and Dirscherl, operating on different cross-linking principles, would never suggest this subject matter to one of skill in the art. Given this significant difference between the state of the prior art and the subject matter of claim 68, under the *Graham* analysis, the rejection of claim 68 and its dependent claims should be reconsidered and withdrawn.

Claim 81 was rejected under 35 U.S.C. § 103(a) over the teachings of Patel-2 taken alone. For at least the following reasons, this rejection is respectfully traversed.

Claim 81 recites;

A method for solid free-form fabrication of a three-dimensional object, layer by layer, said method comprising:
for each layer formed,
first selectively ink-jetting an ultraviolet initiator in a pattern that defines a cross-sectional area of said three-dimensional object;

200314101-1

10/701,885

then, depositing a bulk amount of phase-change material in a defined region over said ultraviolet initiator; and exposing said ultraviolet initiator to an ultraviolet light to facilitate cross-linking of said phase-change material.
(Emphasis added).

Applicant notes that claim 81 recites that, “*for each layer formed*,” an ultra-violet initiator is “first” selectively inkjetted in a pattern that defines a cross-sectional area of an object being fabricated. Then, after the initiator *for each layer* is selectively deposited, a bulk amount of phase-change material is deposited “over said ultraviolet initiator.” Again, claim 81 expressly recites that this is the procedure performed “*for each layer formed*.”

In contrast, Patel-2 does not teach or suggest this subject matter. To the contrary, Patel-2 teaches away from this subject matter. Patel-2 expressly orders the fabrication steps differently. According to Patel-2, a layer of build material is first defined, followed by “applying a second material in the form of a liquid reagent to the layer of first material in a pattern corresponding to the model, and *repeating these steps to form successive layers*.” (Patel-2, claim 1) (emphasis added). Thus, Patel-2 teaches that, for each layer formed, the build material is deposited first, followed by a reagent in a specific pattern.

Thus, Patel-2 not only fails to teach or suggest the subject matter of claim 81, but actually teaches away from the claim. A reference must be considered for all it teaches, including disclosures that teach away from the invention as well as disclosures that point toward the invention. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.* 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985).

Again, under the analysis required by *Graham v. John Deere*, 383 U.S. 1 (1966), the scope and content of the prior art must first be determined, followed by an assessment of the differences between the prior art and the claim at issue. In the present case, the state of the prior art, as evidenced by Patel-2, clearly did not include the method of claim 81 in which,

200314101-1

10/701,885

“for each layer formed,” an ultraviolet initiator is “first” deposited in a pattern that defines a cross-sectional area of an object being fabricated. Then, after the initiator *for each layer* is selectively deposited, a bulk amount of phase-change material is deposited “over said ultraviolet initiator.” To the contrary, the state of the prior art, as evidenced by Patel-2, teaches away from this method. Given the clear significance of this difference with the state of the prior art, Patel-2 clearly cannot support a rejection of claim 81 under *Graham* and § 103. For these various reasons, the rejection of claim 81 should be reconsidered and withdrawn.

Claim 82 was rejected under 35 U.S.C. § 103(a) over the combined teachings of Patel-2 and either Kramer-1 or Kramer-2. As above, this rejection is respectfully traversed under 35 U.S.C. § 103(c). As demonstrated above, under 35 U.S.C. § 103(c) Kramer-1 and Kramer-2 cannot be applied as prior art against the present application in a rejection under § 103(a). For at least this reason, this rejection, based in part on the Kramer references, should be reconsidered and withdrawn.

Double Patenting:

Claims 1-6, 9, 11, 15 and 17-29 were rejected on the ground of non-statutory obviousness-type double patenting over U.S. Patent No. 7,120,512 (Kramer-1). Claims 12, 13 and 30 were rejected on the ground of non-statutory obviousness-type double patenting over Kramer-1 taken in combination with Dirscherl.

Without conceding any correspondence between the claims of the present application and the cited patent to Kramer (Kramer-2), to expedite the allowance of this application, Applicant has filed herewith a terminal disclaimer of the present application with respect to

200314101-1

10/701,885

U.S. Patent No. 7,120,512. Following entry of this terminal disclaimer, the double patenting rejection of the present application should be reconsidered and withdrawn.

Claims 1-6, 9, 11, 15, 17-29, 81 and 82 were *provisionally rejected* on the ground of non-statutory obviousness-type double patenting in view of co-pending Application No. 11/345,479. Claims 12, 13 and 30 were *provisionally rejected* on the ground of non-statutory obviousness-type double patenting in view of co-pending Application No. 11/345,479 taken in combination with Dirscherl.

Because these rejections are merely *provisional*, Applicant does not take any position at this time with regard to the alleged correspondence between the present claims and those of co-pending Application No. 11/345,479. However, Applicant does note that the present application was filed November 4, 2003, well before co-pending Application No. 11/345,479, which was filed February 1, 2006.

Applicant further notes that MPEP § 804 states:

If a "provisional" nonstatutory obviousness-type double patenting (ODP) rejection is the only rejection remaining in the earlier filed of the two pending applications, ... the examiner should withdraw that rejection and permit the earlier-filed application to issue as a patent without a terminal disclaimer.
(MPEP § 804).

200314101-1

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JUN 28 2007

Conclusion:

For the foregoing reasons, the present application is thought to be clearly in condition for allowance. Accordingly, favorable reconsideration of the application in light of these remarks is courteously solicited. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,



Steven L. Nichols
Registration No. 40,326

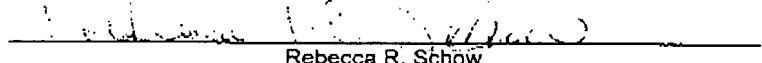
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Steven L. Nichols, Esq.
Managing Partner, Utah Office
Rader Fishman & Grauer PLLC
River Park Corporate Center One
10653 S. River Front Parkway, Suite 150
South Jordan, Utah 84095

(801) 572-8066
(801) 572-7666 (fax)

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Rebecca R. Schow